New Jersey Semi-Conductor Products, Inc.

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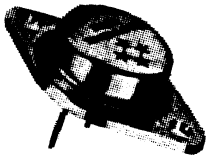
15 Amp NPN
300, 350, 400V
2N6653, 54, 55
XGSR15030, 35, 40

$C^2R^{®}$ HIGH SPEED/HIGH POWER SWITCHING TRANSISTORS

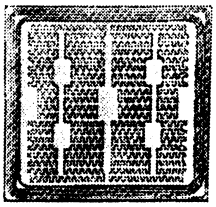


TO-3

The XGSR series is an NPN double diffused epitaxial transistor designed for high speed switching systems. This unique series utilizes General Semiconductor Industries' C^2R process (patent applied for) which describes a manufacturing technology that provides surface stabilization for high voltage operation and enhances long term reliability. Another design feature is the use of an interdigitated emitter providing a periphery greater than 7.0 inches (18 cm) which improves both the gain characteristics and current handling capability.

These transistors have been specifically designed and engineered for high speed/high voltage switching applications where the designer is concerned with optimizing power conversion efficiency.

In order to supply the user with a more complete definition of the C^2R switching transistor capability, General Semiconductor Industries has attempted to furnish a data sheet with a thorough and meaningful technical dialogue.



$C^2R^{®}$

FEATURES:
- HIGH VOLTAGE
- HIGH GAIN
- HIGH CURRENT
- LOW SATURATION VOLTAGES
- FAST SWITCHING
- LOW LEAKAGE CURRENT

APPLICATIONS:
- HIGH SPEED SWITCHING
- POWER CONVERSION
- CONVERTERS
- INVERTERS
- CLASS D AMPLIFIERS
- CLASS C AMPLIFIERS

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)		2N6653 XGSR15030	2N6654 XGSR15035	2N6655 XGSR15040	
RATING	SYMBOL				UNIT
Collector-Base Voltage	V_{CBO}	350	400	450	Volts
Collector-Emitter Voltage	V_{CEO}	300	350	400	Volts
Emitter-Base Voltage	V_{EBO}	7.0	7.0	7.0	Volts
Collector Current - Continuous	I_C	20	20	20	Amps
Peak	I_{CM}	30	30	30	Amps
Base Current-Continuous	I_B	10	10	10	Amps
Emitter Current - Continuous	I_E	30	30	30	Amps
Peak	I_{EM}	40	40	40	Amps
Total Power Dissipation @T_C = 100°C	P_D	75	75	75	Watts
Total Power Dissipation @T_C = 25°C	P_D	150	150	150	Watts
Junction to Case Thermal Resistance	$R_{\theta JC}$	1.0	1.0	1.0	°C/W
Operating and Storage Junction	T_J (oper)	-65 to +175	-65 to +175	-65 to +175	°C
Temperature Range	T_{stg}	-65 to +200	-65 to +200	-65 to +200	°C

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

		2N6652 XGSR15030		2N6654 XGSR15035		2N6655 XGSR15040		
SYMBOL	CONDITIONS	Min.	Max.	Min.	Max.	Min.	Max.	UNIT
V_{CBO}	I_C = 1.0mA	350	—	400	—	450	—	Volts
V_{CEO}	I_C = 50mA	300	—	350	—	400	—	Volts
V_{EBO}	I_E = 1.0mA	7.0	—	7.0	—	7.0	—	Volts
$V_{CEX\ (SUS)}$	I_C = 50mA, V_{BE} = -1.5V	350	—	400	—	450	—	Volts
$V_{CER\ (SUS)}$	I_C = 50mA, R = 47Ω	325	—	375	—	425	—	Volts
I_{CBO} (1)	V_{CB} = 80% V_{cb} Rated	—	500	—	500	—	500	μA
(2)	V_{CB} = 100% V_{cb} Rated, V_{BE} = -1.5V	—	100	—	100	—	100	μA
I_{EBO} (1)	V_{EB} = 5.0V	—	100	—	100	—	100	μA
I_{EBO}	V_{EB} = 7.0V	—	50	—	50	—	50	μA
I_{CEO}	V_{CE} = 80% V_{CE} Rated	—	1.0	—	1.0	—	1.0	mA
I_{CEX}	V_{CE} = V_{CEO} Rated, V_{BE} = -1.5V, T_J = 150°C	—	3.0	—	3.0	—	3.0	mA
h_{FE}* (1)	V_{CE} = 5.0V, I_C = 15A	10	—	10	—	10	—	
h_{FE}* (2)	V_{CE} = 2.0V, I_C = 15A	10	—	10	—	10	—	
$V_{CE\ (sat)}$*	I_C = 15A, I_B = 3A	—	0.8	—	0.8	—	0.8	Volts
$V_{BE\ (sat)}$*	I_C = 15A, I_B = 3A	—	1.3	—	1.3	—	1.3	Volts
f_T	V_{CE} = 10V, I_C = 1.0A, 10MHz	25	75	25	75	25	75	MHz
C_{obo}	V_{CB} = 10V, f = 1MHz	100	300	100	300	100	300	pF
t_d	V_{CC} = 200V, I_C = 15A, I_{B1} = I_{B2} = 3.0A, t_p = 10μs, Duty Cycle <2.0%, Resistive	—	0.05	—	0.05	—	0.05	μsec
t_r		—	0.2	—	0.2	—	0.2	μsec
t_s		—	1.5	—	1.5	—	1.5	μsec
t_f		—	0.35	—	0.35	—	0.35	μsec

*Pulse measurement conditions: Length = 300 μsec, Duty Cycle < 2% (measured using separate current carrying and voltage sensing leads).

Quality Semi-Conductors